

NOTES ON THE ECOLOGY, PHENOLOGY, AND DISTRIBUTION
OF *POLLANISUS EUMETOPUS* TURNER (LEPIDOPTERA:
ZYGAENIDAE, PROCRIDINAE, ARTONINI)

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Abstract

New data are provided on the ecology, phenology and morphology of the zygænid moth *Pollanisus eumetopus* Turner, 1926. The known distribution of the species is significantly increased. The chaetotaxy of the first instar larva is described and the setal arrangement appears to be characteristic for the Artonini. The larvae possess three anal combs similar to other species of the genus *Pollanisus* and of the tribe Artonini. The presence of a small ball of silk spun on the outside of the cocoon is a character apparently typical of the genus *Pollanisus* but has not been described for other Procridinae. The colour of ocelli, formerly considered an important character for distinguishing species of *Pollanisus*, is variable in dried specimens of *P. eumetopus* and therefore not suitable for species identification.

Introduction

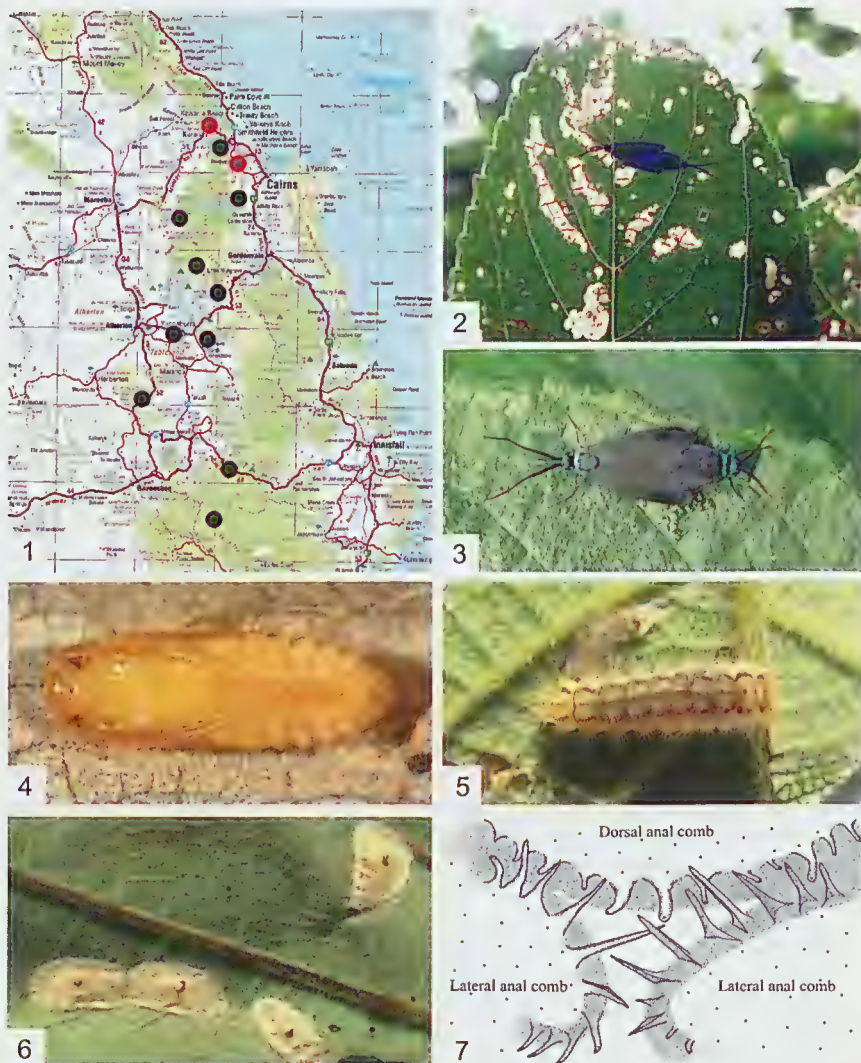
Pollanisus eumetopus Turner, 1926 is a localised species, previously known only from the Cairns area, Queensland, Australia, with records from the type locality, Kuranda (Turner, 1926: 443), and Redlynch. Only six males and five females were previously known (Tarmann, 2004: 97).

Recently, the senior author discovered a series of new populations (Fig. 1) by actively searching the host-plant, *Pipturus argenteus* (G. Forster) Wedd. (Urticaceae) (Fig. 2), thus extending the known distribution of *P. eumetopus* significantly further south. Locality data are presented for each new population and the life history stages observed on the host plant are noted. So far, *Pollanisus eumetopus* is the only Zygaenidae known to feed on the Urticaceae. Other known hostplants of species of *Pollanisus* belong to the Dilleniaceae and Fabaceae.

Methods

Observations and collections of Zygaenidae were made during the day, mainly within National Parks under a scientific purposes permit WITK05084508 issued to the senior author.

Terminology of the setal arrangement of the first abdominal segment of the first instar larva follows Efetov, Keil, Mollet & Tarmann (2000) and describes the position, number and colour of setae. Abbreviations used in the description are as follows: D (dorsal), SD (subdorsal), L (lateral), *l* (light), *d* (dark).



Figs 1-7. Distribution and life history of *Pollanisus eumetopus* from west of Cairns, Qld: (1) Map of known localities ●, new localities ●; (2) larval host plant *Pipturus argenteus* leaves with feeding marks and *P. eumetopus* mating; (3) *P. eumetopus* (X2) mating on the 26.v.2008; (4) pupa, ventral view; (5) final instar larva; (6) cocoons with small ball of spun silk attached to the outside; (7) combination of the three anal combs (X100) of the 4th instar larva of *P. eumetopus*.

Material examined

Barron Gorge National Park, 16°51.132'S 145°38.921'E, 65 m, 10, 26.v.2008, eggs, L4, adults; Road to Lake Morris, 16°55.020'S 145°43.017'E, 150 m, 25/26.v.2008, eggs, L1 to L5, adults; Davies Creek Falls, Dinden National Park, 17°02.139'S 145°36.736'E, 560 m, 19.v.2008, eggs, L1, L2; North Lake Tinaroo 17°08.003'S 145°36.026'E, 730 m, 18.v.2008, L1 to L4; Lake Eacham National Park, 17°17'S 145°37'E, 775 m, 17.v.2008, eggs; L1 to L5; Cathedral Fig Tree National Park, 17°10.654'S 145°36.026'E, 770 m, 18.v.2008, eggs, adults; Curtain Fig Tree National Park, 17°16.825'S 145°34.547'E, 720 m, 19.v.2008, eggs; Mount Hypipamee National Park, 17°25'S 145°09'E, 975 m, 17.v.2008, eggs, L1, L2; Palmerston Hwy, Wooroonooran National Park, 17°34.466'S 145°41.388'E, 650 m, 21.v.2008, eggs, L1 to L4. Misty Mountains, Wooroonooran National Park 17°41.420'S 145°41.732'E, 600 m, 21.v.2008, eggs, L1 to L4, adults.

Specimens are deposited in the collections of the authors with some eventually to be deposited in the Australian National Insect Collection (ANIC).

Phenology and bionomics

Eggs are laid on the underside of the leaves of *Pipturus argenteus* in small groups and are covered with the abdominal setae of the female. Larvae emerge 10 to 15 days after oviposition. First instar larvae (L1) remain grouped near the eggs and feed on the underside of the leaves producing small holes. From L2 to L7 (final instar) (Fig. 5) the larvae disperse over the leaves, always remaining on the undersides. The larval feeding marks progressively widen and the final result is an almost transparent, skeletonised leaf. Because this was the first record of a zygaenid feeding on Urticaceae, larvae of L1, L2, L6 and L7 instars were offered leaves of two exotic species of species of Urticaceae, *Urtica dioica*. and *Parietaria judaica*. Larvae of L1 and L2 refused *P. judaica* and *U. dioica*; larvae of L6 and L7 refused *P. judaica* but readily accepted *U. dioica* for two days but then died, possibly because of certain urticant constituents of the plant

The full-grown, 7th instar larva (length ca. 8 mm) pupates in a flat, tight, semi-stiff, beige cocoon (Fig. 6). The pupa is light brown-yellow colour and 5-7 mm in length (Fig. 4). There is a distinctive, small ball of silk, spun on the outside of the cocoon. The presence of this ball is a character that has not been observed in other Procridinae to date. However, this structure is also present on cocoons of *Pollanisus edwardsi* Tarmann, 2004 and *Pollanisus commoni* Tarmann, 2004 (unpublished data) and was present on all cocoons observed. Adults of *P. eumetopus* emerged about 20 days after construction of the cocoon.

Pollanisus eumetopus is a rainforest species. Females fly little and remain mostly on the underside of *Pipturus argenteus* leaves. Males fly during dry periods of the day and were occasionally observed in groups of ten to fifteen individuals flying actively around the top of the hostplant, most likely attracted by pheromones of virgin females positioned on the upper side of the

highest leaves. Mating (Fig. 3) is very rapid and is followed by the almost immediate disappearance of the uncoupled males presumably as the females stop 'calling'. No individuals were seen nectaring.

The simultaneous presence of all life cycle stages of *P. eumetopus*, combined with a known flight period of adults from October until May (Tarmann, 2004: 97) suggest that *P. eumetopus* is a multivoltine species.

Description of the first instar larva

The L1 is of a cream colour and about 1.2 mm in length. The brown lateral spots on the subdorsal part of the third thoracic segment and on the second and fifth abdominal segments present in the larva of *Pollanisus subdolosus clara* Tarmann, 2004 (Tarmann, 2004: 90, pl. 59, figs 3-5) are absent in *P. eumetopus*.

The setal formula of the first abdominal segment of the first instar larvae is: **D: 1d; SD: 1d, 1l; L: 2l.**

This arrangement appears characteristic of the Artonini and is known for *Levuana iridescens* Bethune-Baker, 1906 (Tothill, Taylor & Paine 1930: 85, fig 20); *Pollanisus viridipulverulenta* (Guérin-Ménéville, 1839) (Tarmann 2004:38, 71, fig 131); *Pollanisus apicalis* (Walker, 1854) (Tarmann 2004:83); *P. subdolosus clara* Tarmann, 2004 (Tarmann 2004: 38, 90, fig 131); *Australartona mirabilis* Tarmann, 2004 (Tarmann 2004: 188); *Clelea esakii* Inoue, 1958 (Efetov 2006: 231, 232, fig 7) and *Artona martini* Efetov, 1997 (Efetov 2008: 102, 103, fig 2).

In Procridinae the structure of the anal comb of the final instar larvae differs between genera and sometimes subgenera (Efetov, 2004: 183). *Pollanisus eumetopus* has a combination of three anal combs, consisting of a larger dorsal comb and two smaller lateral combs (Fig. 7) arranged around the anal orifice. These combs consist of one row of long and stiff spines each with a triangular base. These bases are connected to form a dark sclerotised band. A combination of three anal combs is present in other species of the genus *Pollanisus* (unpublished data) and also in other genera of the tribe Artonini (Tothill, Taylor & Paine 1930:95, figs 39, 40).

Remarks on adult morphology

Examination of the ocelli of field-collected adults of *P. eumetopus* as well as reared adults shows that their colour is variable. The colour of the ocelli was a character was used by Tarmann (2004) to separate *Pollanisus* species. On living specimens the ocelli are black and shiny. Some hours after death they become matt and after desiccation they turn from white to light brown and eventually to black, with some specimens having one black and one white ocellus. As a consequence of this variability, the colour of the ocelli can not be used to separate the species of the genus *Pollanisus*.

Distribution

The new localities listed here increase the known distribution for *P. eumetopus* by 160 km south of its former recorded range in the Cairns district. As the known distribution of the larval host plant ranges from northern Queensland to northern New South Wales, *P. eumetopus* may be even more widely distributed.

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